



Listing of Claims:

1. (Previously presented) A method of producing an adsorption medium, comprising:
dissolving at least one metal compound in a solvent to form a metal solution;
dissolving polyacrylonitrile (PAN) into the metal solution to form a PAN-metal solution;
and
depositing the PAN-metal solution into a quenching bath to form an adsorption medium comprising PAN and at least one metal hydroxide.
2. (Original) The method of claim 1, wherein dissolving at least one metal compound in a solvent to form a metal solution comprises dissolving at least one metal salt, at least one metal oxide, or mixtures thereof in the solvent.
3. (Original) The method of claim 1, wherein dissolving at least one metal compound in a solvent to form a metal solution comprises dissolving at least one salt or at least one oxide of a divalent, a trivalent, or a tetravalent metal in the solvent.
4. (Previously presented) The method of claim 1, wherein dissolving at least one metal compound in a solvent to form a metal solution comprises dissolving at least one salt or at least one oxide of at least one of a transition metal, a lanthanide or rare earth metal, a Group III metal, a Group IV metal, and a Group V metal in the solvent.
5. (Original) The method of claim 1, wherein dissolving at least one metal compound in a solvent to form a metal solution comprises dissolving the at least one metal compound having a metal cation selected from the group consisting of iron, zirconium, lanthanum, cerium, titanium, aluminum, tin, silver, zinc, mercury, bismuth, copper, antimony, tungsten, and molybdenum in the solvent.

6. (Original) The method of claim 1, wherein dissolving at least one metal compound in a solvent to form a metal solution comprises dissolving at least one metal salt selected from the group consisting of a metal chloride, a metal oxychloride, a metal sulfate, a metal nitrate, and a metal acetate in the solvent.
7. (Original) The method of claim 1, wherein dissolving at least one metal compound in a solvent comprises dissolving the at least one metal compound in concentrated nitric acid.
8. (Previously presented) The method of claim 1, wherein dissolving at least one metal compound in a solvent comprises dissolving an amount of the at least one metal compound sufficient to produce the metal solution saturated with the at least one metal compound.
9. (Previously presented) The method of claim 1, wherein dissolving PAN into the metal solution comprises dissolving from approximately 3% by weight to approximately 5% by weight of PAN into the metal solution.
10. (Previously presented) The method of claim 1, wherein depositing the PAN-metal solution into a quenching bath to form an adsorption medium comprises spraying the PAN-metal solution into the quenching bath that includes an alkaline agent to form the adsorption medium.
11. (Previously presented) The method of claim 1, wherein depositing the PAN-metal solution into a quenching bath to form an adsorption medium comprises spraying the PAN-metal solution into the quenching bath that comprises from approximately 0.1M sodium hydroxide to approximately 8M sodium hydroxide to form the adsorption medium.
12. (Previously presented) The method of claim 1, wherein depositing the PAN-metal solution into a quenching bath to form an adsorption medium comprises simultaneously precipitating at least one metal hydroxide from the PAN-metal solution and insolubilizing the PAN in the PAN-metal solution.

13. (Previously presented) The method of claim 1, wherein depositing the PAN-metal solution into a quenching bath to form an adsorption medium comprises producing a solid bead comprising at least one metal hydroxide incorporated into the PAN.

14. (Previously presented) The method of claim 1, further comprising impregnating a support with the adsorption medium.

15. (Previously presented) The method of claim 1, further comprising impregnating a support with at least one metal hydroxide incorporated into the PAN.

16. (Previously presented) The method of claim 1, wherein depositing the PAN-metal solution into a quenching bath to form an adsorption medium comprising PAN and at least one metal hydroxide comprises producing an adsorption medium having from approximately 10% by weight to approximately 85% by weight of a metal in the form of an elemental metal or the at least one metal hydroxide and from approximately 15% by weight to approximately 90% by weight of the PAN.

Claims 17-21 (Canceled)

22. (Previously presented) An adsorption medium having an increased metal loading, comprising:

a polyacrylonitrile (PAN) matrix and at least one metal hydroxide, the PAN matrix comprising from approximately 15% by weight to approximately 90% by weight of the adsorption medium and the at least one metal hydroxide comprising from approximately 10% by weight to approximately 85% by weight of the adsorption medium.

23. (Previously presented) The adsorption medium of claim 22, wherein the adsorption medium comprises at least approximately 50 wt% of the metal in the form of an elemental metal or the metal hydroxide.

24. (Original) The adsorption medium of claim 22, wherein the at least one metal

hydroxide is substantially homogenously dispersed in the polyacrylonitrile matrix.

25. (Previously presented) A method of producing an adsorption medium, comprising:
dissolving polyacrylonitrile (PAN) in an organic solvent to form a PAN solution;
adding at least one metal oxide to the PAN solution to form a metal oxide-PAN solution;
and
depositing the metal oxide-PAN solution into a quenching bath to form an adsorption medium comprising PAN and at least one metal hydroxide.

26. (Original) The method of claim 25, wherein adding at least one metal oxide to the PAN solution to form a metal oxide-PAN solution comprises adding at least one powdered metal oxide to the PAN solution.

27. (Previously presented) The method of claim 25, wherein depositing the metal oxide-PAN solution into a quenching bath to form an adsorption medium comprises depositing the metal oxide-PAN solution into a water bath to form the adsorption medium.